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AUTHOR	Wagner, Cheryl
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ABSTRACT

This publication covers the planning and design of school grounds for outdoor learning in new and existing K-12 facilities. It discusses the different types of outdoor learning environments that can be considered, the value of flexible spaces for outdoor learning, and resources for those interested in outdoor learning environments. Also explored are environmental education's physical impact on school grounds, considerations during school site development when outdoor education is to be included, and existing school site redesign for outdoor education. (Contains 20 references.) (GR)

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Planning School Grounds for Outdoor Learning

Cheryl Wagner, National Clearinghouse for Educational Facilities
May 2000

Every school's grounds are potential educational spaces where concepts taught within the school building can come alive to students. Research shows that students better absorb and retain math, science, language arts, and other skills that incorporate their immediate environment and use all five senses (Lieberman and Hoody 1998). Once we accept that education naturally occurs both indoors and out, the term "outdoor learning" will begin to seem as strange as the never used "indoor learning."

Thoughtful and imaginative teamwork by designers, teachers, students, facilities personnel, and parents can develop a new or existing school site's full potential in ways that create:

- a more flexible learning environment with greater educational options overall;
- a safer school less prone to student vandalism and accidents;
- a closer cultural connection to the surrounding community;
- environmental and energy savings from wisely adapting the building to the site;
- cost savings during facility construction and in ongoing maintenance.

This publication covers the planning and design of school grounds for outdoor learning in new and existing K through 12 facilities. Curriculum development as well as athletic field planning and maintenance are not covered although some references on these topics are provided.

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Background

Educators have used the outdoors for teaching, gardening, and physical education for more than 100 years. Interest in outdoor learning ebbs and flows, but a heightened international awareness of outdoor learning exists today.

The National Environmental Education Act of 1990 called attention to how the natural environment could be included in curricula at every educational level. During the past decade, the U.S. Environmental Protection Agency (EPA) and various other public and private organizations have produced numerous resources for incorporating environmental education into the K-12 school curriculum.

In the United Kingdom, environmental education became more directly linked to the use of school grounds when Learning through Landscapes (LtL) was founded in 1990. LtL works closely with the British government's Department for Education and Employment (DfEE) to enable schools to utilize their grounds for outdoor learning of all kinds. Both LtL and DfEE publish high quality grounds maintenance and curriculum guides and compile best practices gathered from British schools nationwide.

Thousands of schools from over a dozen countries now participate in the annual international School Grounds Day, which was inaugurated in 1995. The first international conference on the use of school grounds for learning was held in England in 1997, co-sponsored by the international Program on Educational Building (PEB), LtL and DfEE (*PEB Exchange* 1998:11-14). Clearly, this aspect of education is being reinvigorated.

The National Environmental Education Advisory Council's 1996 report highlighted the interdisciplinary nature of outdoor learning but cautioned that environmental education is not yet well integrated into American education reform (National Environmental Education Advisory Council 1996:16). Many resources to help

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school personnel rethink school grounds as places for learning are available, however. British publications in particular go beyond traditional playgrounds, athletic fields, and even nature study to cover the entire range of curricula and grade levels. Allen Abend, director of Facilities Planning for the Maryland Department of Education emphasizes the "need to be thinking about how we can preserve or develop a rich, natural environment at every school that will be a resource to its educational program" (Coffee *School Planning and Management* 1999:35).

Types of Outdoor Learning Environments

When considering outdoor learning environments for new or existing facilities it helps to articulate the school's educational program before examining the specific instructional objectives of individual departments and faculty members. While environmental education is most frequently associated with outdoor learning in the United States, there are many types of educational, recreational, and social skills that may be successfully taught outdoors. A recent DfEE publication on outdoor classrooms provides useful examples of how school grounds may be used effectively to teach language, mathematics, science, geography, drama, art, music, and more (DfEE 1999:1-14)

Outdoor learning spaces include pathways, play structure areas, gardens, sandy spaces, aquatic areas, seating areas of various sizes, ball fields, dramatic play areas, wooded areas, and covered pavilions or porches. Special outdoor spaces such as the musical play area recently built in Sweden through collaboration between students, teachers, an artist, and landscape architect may be created also. The space now contains large-scale percussive instruments built on wooden frames -- a pine marimba, a set of chimes, aluminum xylo-bars, and a set of gongs (Dacapo Hantverksskola 1999).

Depending on the age groups served by a school, it can also be useful to consider the types of play children engage in and then design areas to accommodate them. In his book, "Creating Environments for Young Children," architect Henry Sanoff lists various types of play typical of preschoolers. He emphasizes that this age group needs outdoor spaces of suitable scale designed to enhance their rapid behavioral development (Sanoff 1995:87–89).

Flexible Spaces

In contrast to specific-use spaces like tennis courts, vegetable gardens, or wetlands, school grounds should include outdoor spaces adaptable to many types of activities. They may be open-air porches adjacent to classrooms, art and science rooms, or cafeterias, and they may include various seating areas, such as amphitheaters, pavilions, steps, planters, benches, or individual student-sized chairs. Research conducted by LtL has found that "because seating enhances children's varied opportunities to socialize, with a friend, in small groups or as a part of the larger school community, it is a critical element on school grounds" (Stine *ASLA* 1997:97).

Some urban schools facing harsh environments and tight budgets have used interior courtyards to accommodate many types of play and group activities. Plants and trees are not necessarily the primary elements in these spaces. In the recently completed 500-student Moylan Elementary School in Hartford, Connecticut, landscape architect Mik Young Kim introduced a child-height serpentine wall with numerous openings and passageways as the space's organizing feature. In addition to children using the wall as a prop for self-invented games, the wall creatively defines areas for physical play on customized climbing equipment and for small group and classroom-sized gatherings (Bennett 1999:86–93).

Large inner city schools, where space is at a premium, may also develop compact space plans in which courtyards and play areas are stacked above parking lots or lunchrooms. The International Elementary School in Long Beach, California, contains various flexible outdoor student spaces, all above street level.

Flexible outdoor spaces are just as valuable in small schools. The 35-student Chilmark School on Martha's Vineyard, Massachusetts, serves grades K through 5, with shared classrooms between grades. The school's grounds, contain a three-tiered amphitheater nestled close to the building and scaled for young children. Its stones come from the foundation of a 19th century schoolhouse previously located on the site.

Environmental Education Resources

Although flexible spaces can serve an environmental education curriculum, environmental education also requires specially designed spaces that offer children

the chance to observe and effect change in the natural world. Once made easily accessible to students and teachers, the outdoors occupies a more significant role in the educational program and the curriculum can evolve along with the outdoor learning environment.

Some teachers may be interested in outdoor environmental education using school grounds but may lack instructional tools. Fortunately, resources in this area are plentiful, with much available online. One of the best Web sites is EE-Link, which gathers together many types of information: lists of organizations, grants, classroom resources, and a calendar of events. EE-Link is funded by the North American Association for Environmental Education (NAAEE), which also hosts an excellent Web site.

The EPA has an Office of Environmental Education that also hosts a Web site. This site has areas for educator training, student opportunities, advisory groups, and an EPA grant program that has awarded over 1,700 grants (totaling over two million dollars) since 1992. The site also provides tips for developing successful grant applications.

The National Wildlife Federation (NWF), a national, not-for-profit organization, has expanded its 30-year-old "Backyard Wildlife Habitat" program into a distinct effort called Schoolyard Habitats, in which over 900 schools nationwide now participate. This program is the most useful for educators looking for specific applications of environmental education in the schoolyard. Its Web site features curriculum ideas, information on registering your school as a NWF Schoolyard Habitat, a schoolyard habitat listserv, and case studies.

These online resources are the most prominent American examples and will lead you to other regional and local resources, but there are also excellent print publications by LtL, including *Using School Grounds as an Educational Resource*, *The Outdoor Classroom: Educational Use, Landscape Design & Management of School Grounds*, and many others, all of which may all be ordered through the Canadian organization Green Brick Road.

Environmental Education on School Grounds

School grounds may contain useful instructional habitats such as wetlands, woodlands, and meadows. They may also have gardens from which herbs, flowers, and vegetables are harvested. Pathways or trails with more intimately scaled areas enable students to experience their environment on a personal level, although all options must be checked against the faculty's instructional objectives and teaching styles. While wetlands and other natural areas may be environmentally beneficial in general, on school grounds their true value emerges only through their integration into the school's overall educational program.

Environmental education can physically impact school grounds. For example:

- An enormous asphalt lot at the 800-student King Middle School in Berkeley, California, was transformed into the Edible Schoolyard Project with help from local restaurant owner Alice Waters. The site now contains a half acre organic garden designed and cared for by 6th and 7th graders. The school's science curriculum for these two grades focuses entirely on the garden and student kitchen, in which students learn about cooking, nutrition, and foods from diverse cultures.

- Chicago's John Hay Community Academy, converted an asphalt-covered schoolyard into a garden that became part of the school's K-5 curriculum. The academy, which serves a predominantly African-American neighborhood, won an award from the Illinois State Council on Business/Education partnerships. In one activity, at the 800-student school, students interviewed relatives about favorite family foods and related these to their school science research and to their newly transformed school garden.

- Brunswick High School in Maine serves 1,200 students and was built in 1996 on a 50-acre site in a coastal watershed protected by strict environmental codes. Required to create wetlands to mitigate increased surface runoff, the architecture and engineering firm Harriman Associates designed the wetlands to serve as an environmental lab, where students monitor the absorption of nitrates and the effect of fertilizers and pesticides on ground water. The town also monitors the wetlands, which to date have functioned as intended (Sutton 1996 and Harriman).

- Meadows are an alternative to some of the expansive lawn areas on many rural and suburban school grounds. Hollywood Elementary School in St. Mary's County, Maryland, involved students in converting one-third of the school's lawn into a wildflower meadow. Students performed some of the

physical work, calculated the environmental advantages meadows offer through reduced mowing schedules and use of pesticides on the grounds, and monitored the newly installed meadow for plant and wildlife colonization (Maryland State Department of Education 1999:33–40).

Considering Outdoor Education During School Site Selection

While outdoor learning environments may be created from existing school sites, options are greatest at the earliest stages of facility planning. State and local education agencies usually publish site selection guidelines or requirements, many with useful criteria lists and evaluation tools. The majority, however, do not include outdoor learning considerations beyond traditional play equipment and athletic fields. For the full spectrum of outdoor learning to be adequately considered, the best current information on the subject should be consulted along with site selection guidelines. Furthermore, the importance of conserving and enhancing the natural environment should be emphasized in the educational specifications document. Early involvement of those who will use and maintain these spaces will bring about the best results, so it is important to involve teachers and students at this stage of the project.

One state's site selection guidelines provide an all too typical example of how potential outdoor learning environments may be inadvertently overlooked. The first step is to prepare an educational program for the site. However, despite the full range of curricula that can benefit from outdoor instruction, the areas and activities to be discussed in this document are limited to:

- physical education and athletics programs,
- nature and conservation education,
- after-hours educational use of facilities, and
- use of off-campus facilities for educational purposes.

A ranking matrix later in the document lists 10 factors comprising site selection: parcel size, shape, location, topography and drainage, accessibility and traffic, security and safety, soil conditions and plant life, noise levels, utilities and costs (Public Schools of North Carolina 1998:9,16). Unfortunately, people ranking these factors are not asked to correlate the results of the educational programming study, even in its limited scope, with their site evaluation.

While all site selection activities listed in these guidelines are valuable individually, the planning exercises need to be integrated to maximize the entire school site for outdoor learning.

Room for the future expansion of a facility on a proposed site should be considered as well as the presence of potentially hazardous substances. California's guidelines and recent legislation specifically address this point, requiring special analysis of landfill areas and a site's proximity to dumps, chemical plants, refineries, fuel storage facilities, nuclear generating plants, abandoned farms . . . and agricultural areas in which pesticides and fertilizers have been heavily used (California Department of Education 1989:5).

Retaining the services of a landscape architect at this point of the process can help a school district avoid costly mistakes. Once a site is selected, the landscape architect will provide valuable guidance regarding site development and integrating environmental concerns with education opportunities and budgeting. The American Society of Landscape Architects' (ASLA) Web site offers a searchable database of landscape professionals. Depending on the site, the services of an environmental planning firm may be advisable. In addition, some architectural and engineering firms provide landscape architectural and environmental planning services in-house. Local college and university landscape architecture departments may also be helpful, as well as local government agencies, such as the Cooperative Extension, Soil Conservation Service, or forestry boards.

Considering Outdoor Education during School Site Development

Once a site is acquired, design development usually proceeds rapidly. Amenities conducive to outdoor learning must be incorporated at this stage, so it is important that the design team includes those committed to creating, employing, and maintaining the outdoor spaces. Preferably, a detailed site survey should be completed prior to the development of a schematic design.

Routine site development tasks should be performed more thoroughly when a school's priorities include maximizing the use of its grounds. Site development

includes preparing an existing vegetation survey and tree protection plan, testing soil, and evaluating the microclimate, including conducting studies of sun and shade patterns at the site. Orientation of the building to the site, provisions for outside access, and a study of pedestrian and vehicular circulation around the school campus are also important for the outdoor educational program's success. Several alternative arrangements should be developed.

Unlike a school facility that is basically completed when students start using it, school grounds take years to develop and grow. Their changing nature is part of what holds students' interest and attention. So while advanced planning is critical to their ultimate success, ample time for growth must also be allowed. A period of five years is not unusual. With the school's commitment, plans will be carried out and changes and adaptations will be made as needed over time.

Details that facilitate use of school grounds are most easily and economically incorporated during design development. These may include outdoor storage areas, access to running water, lighting, overhead shelter, seating, signage, and trash receptacles.

Design development should address all site components and integrate driveways, service roads, parking, and athletic fields with the rest of the outdoor spaces. Adjacency requirements need to provide for safety, air quality, and noise control.

Urban schools with outdoor spaces located on rooftops or terraces must be designed in close collaboration with the project's structural engineer. Trees, grass, gardens, irrigation, furniture, and play equipment may all be installed on roof decks that have been designed for these loads and have provisions. Fire and safety codes for roof gardens provide guidance with regard to access, setbacks, enclosure, and the percentage of wooden structures allowed.

Redesigning Existing School Sites

The design concerns and processes for working on existing school grounds are similar to those for new schools. However, when attempting to redesign a school site, funding is usually more difficult to obtain. Consequently, the school site assessment should include taking inventory of available community and human resources because volunteer labor and donated materials can play an important role in the project's success.

Studies of how students use existing school grounds may be performed and then compared to how they are intended to be used in the future. Involving students in assessments of existing school grounds is an excellent way to solicit feedback. While mostly intended for existing indoor spaces, the checklists provided in Sanoff's *Creating Environments for Young Children* can easily be adapted to the outdoor environment. The book *Natural Learning* by Robin Moore and Herb Wong describes a California schoolyard that was completely transformed over a period of 10 years from an asphalt lot into a diverse educational environment. Moore's and Wong's book provides useful examples of how student, teacher, and community feedback and assistance were elicited over the years.

The National Wildlife Federation's resources are primarily directed to educators working on existing school grounds. The Schoolyard Habitats network of nearly a thousand schools is another excellent resource.

Selected Organizations and Agencies

American Society of Landscape Architects; http://www.asla.org

Department for Education and Employment (DfEE); http://www.dfee.gov.uk/. DfEE is a British agency that publishes books on school buildings and grounds. See http://www.dfee.gov/uk/schbldgs/pubs.html. For school grounds see BB85 *School Grounds: A Guide to Good Practice*, BB71 *The Outdoor Classroom*, 2ed. 1999.

EE-Link; http://ee-link.net/

Learning Through Landscapes Trust (LtL), Southside Offices, the Law Courts, Winchester, Hampshire SO23 9DL, UK. LtL is an independent British organization concerned solely with school ground design, their educational use and maintenance. LtL publishes books, videos, and CDs, which are distributed in North America through the Green Brick Road., http://www.gbr.org, 429 Danforth Ave., Ste. 408, Toronto, ON, Canada M4K 1P1; telephone 800-473-3638.

National Clearinghouse for Educational Facilities; http://edfacilities.org/ir/hottopics.cfm See Hot Topics *Outdoor Learning, Site Selection, Playgrounds, Accessibility, Impact of Facilities on Learning,* and *Athletic Facilities Planning & Maintenance*

National Wildlife Federation, Schoolyard Habitats Program; http://www.nwf.org/habitats/schoolyard/index.html

The Natural Learning Initiative; http://naturalearning.org

A research and extension program of the School of Design, North Carolina State University.

North American Association for Environmental Education (NAAEE); http://naaee.org

U.S. Environmental Protection Agency (EPA), Office of Environmental Education; http://www.epa.gov/enviroed/index.html

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Reviewers

Allen Abend, Ed Kirkbride, Carol MacDonald, Margaret Pennock, David Woods,

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